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**How can packaging change children's eating habits from un-healthy food towards
healthier options?**

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A project carried out on the Field Lab on Children Consumer Behaviour, under the
supervision of Professor Luísa Agante

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Abstract

This experiment has the purpose of testing and measure the influence of packaging on children consumer behavior. More specifically, we seek to evaluate the impact that packaging can have on shifting children's snack preferences from unhealthy food towards healthier options.

The study was conducted through individual questionnaires done by 106 children aged from 7 to 9 years-old. There were two distinct groups in the sample (a control group and an experimental group) that were presented with two different visual options of a food snack each – a healthy option and a non-healthy one. The difference between the two groups was the packaging form of the healthy snack that they were presented with. Both groups were presented with the same packaging form for the unhealthy option.

Results show that a healthy snack is more likely to have a positive impact on packaging overall evaluation, fun perception and preference over a non-healthy snack, if it is presented in a fun packaging, in contrast to a regular one, although it does not influence the taste perception of the product.

Such findings suggest that packaging can be a powerful tool that can be used as a marketing strategy to promote healthy food as well as gain market share to non-healthy products.

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Introduction

Obesity is one of the greatest public worldwide health challenges of the 21st century.

The majority of the population, which means one in five children, is overweight or obese in the OECD area (OECD, 2014).

Obesity problems affects all ages. It gets even worse when it comes to children because it will have repercussions in public health somewhere in the future. Over 60% of children that are overweight in their childhood will also be overweight in their early adulthood (WHO, 2014). The total number of overweight or obese children aged 0 to 5 years increased from 31 million in 1990 to 44 million in 2012 (WHO, 2014). So it is important to address the obesity problem as soon as possible during childhood since children's minds can be shaped more easily and their social behaviors now will persist in the future as well (Kagan & Moss, 1962). This project aims to evaluate a possible prevention solution for this problem through a marketing strategy.

The main goal throughout this paper is therefore to find evidence of a sustainable way of promoting healthful habits among children in which packaging will be used as a marketing tool. That is, we expect to find a way of increasing children's willingness to eat healthily by using a vehicle (packaging) that is under marketers' influence and of which they can make use in their future campaigns.

There are two previous studies, addressing this problem, that were conducted by Novasbe students already. The first one (Pires & Agante, 2011) showed that packaging that looks similar to junk food can positively influence children's attitudes towards the healthy product and respective purchase intention. The second one (Castelo, 2013) found out that a fun packaging also positively influences the purchasing intention and perceived tastiness of the healthy product even after tasting the product.

However, both experiments focused on the impact that packaging would have on healthy food alone, and compare “fun” healthy food with “non-fun” healthy food, so the children that constituted the experiment sample were only given healthy food choices to evaluate and compare and therefore it was concluded that “fun” healthy snacks are more appealing than “non-fun” healthy snacks. At this point we already know that packaging can play an important influential role at changing perceptions and preferences within healthy food. The question that remains unanswered is how greater that impact can be in order to persuade children to eat healthy food more often instead of non-healthy food. Is packaging in fact a marketing vehicle that can push children choices towards healthier options regarding food, over non healthy ones?

We also took into account another dimension, which is the business and corporate dynamics, and, the power of such marketing strategies targeting children. Considering the US alone, it is estimated that the food and beverage industry as well as the fast food industry spend approximately 2 billion dollars and more than 5 million dollar, respectively, on marketing strategies targeting the children market (Kovacic, 2008). So, given this reality, can packaging be a sustainable mechanism for healthy related companies or products to steal market share from non-healthy ones?

Summarizing the whole objective of this research, we will seek to evaluate the willingness to change the choice from a non-healthy food option to a healthier one, manipulating visually the packaging designed for the healthier option towards a funnier kind. The children will then evaluate each one individually, compare both in terms of packaging evaluation, attitudes towards the products and finally decide which one they would prefer to try.

Literature Review

The obesity challenge

Obesity is a medical condition whose statistics have been growing over the past decades and the people affected by this health issue have actually doubled in number between 1980 and 2008 (WHO, 2014). It is expected that 3.4 million adults die each year due to this problem, apart from many more that die because of diabetes, heart diseases and cancer, all attributable to overweight and obesity as well (WHO, 2014).

We are facing a big public health challenge nowadays, so it becomes even more important to get this sense of healthiness when it comes to children because they are still in a learning age where they can be “reeducated” by being exposed and absorbing new experiences (such as healthful eating habits) which will be replicated in the future through their adult life. To have a more factual notion of the importance of addressing this problem towards children, it is estimated that over 60% of children that are overweight in their childhood will also be overweight in their early adulthood (WHO, 2014).

In fact, in 2012, more than one third of children and adolescents were overweight or obese, in the US (Ogden et al, 2014). Europe also follows such trend and in Portugal there are about 1 million of adults that are actually obese and 3.5 million pre-obese. When it comes to children, about 15% children between 6 and 9 years old are obese and more than 35% are overweight¹.

¹ Opublico online, Natália Vilarinho 24/10/2013

This medical condition can become a serious issue in terms of risk factors such as cardiovascular disease, diabetes, orthopedic problems, mental disorders, poor performance in school and can also promote lower self-esteem of the self (WHO, 2014).

Why targeting children? – Cognition Development

As we have seen above, obesity is a serious public health issue these days. This paper focuses on children since this is the right way to start, for two reasons: 1) children's minds can be shaped easily, and 2) their social behaviors now will persist for the future.

As individuals we begin to collect and absorbing information since young age but the key factor is how we process and use that information. We tend to think differently and in a more complex way as we grow up and a child's cognitive development is positively correlated with age (Piaget 1952, 1970). Regarding this matter, according to Piaget's (1928) theory, we can identify four main stages of children's cognitive development: *sensorimotor* (birth to two years); *pre-operational* (two to seven years); *concrete operational* (seven to eleven years); and *formal operational* (eleven through adulthood).

For this particular experiment we are looking to seek information regarding children between the second and the fourth grades (7 to 9) as it will be explained in more detail later in the methodology section, so it would fall under the *concrete operational* stage.

This is the right age interval because according to Piaget, at the *concrete operational* stage (seven to eleven) kids start to develop logic thinking although they still struggle with abstract and hypothetical concepts. Children that fall under this stage can already solve problems regarding concrete events or objects, which would not be possible when dealing with children in the *pre-operational* stage (two to seven years), who do not understand concrete logic and still cannot mentally manipulate information. On the

other hand, the *formal-operational* stage already falls into adolescence and adulthood so it would not fit the purpose of this particular study, since we are trying to tackle the issue with children as young as possible, and as their level of cognition development allows us to conduct such experiment successfully.

After understanding deeply the children's mindset, we consider that this would be the right time to act and make a difference, by shaping the children's minds towards a better and healthier lifestyle. In fact, and supporting this idea, it was shown that it is easier to develop healthful eating habits among children rather than adults (Klein-Hessling et al, 2005). Also, we tend to believe that eating patterns established during childhood are likely to persist over time throughout life (Lien et al, 2001; Lowe et al, 2004).

Children relation with non-healthy food

Non healthy food is at the top of the list for children's food preferences. Reviewing some of the literature that is already available, we can conclude that children are pushed towards non healthy options when facing their own food choices for several reasons. First their natural instinct, which is represented by their palate, plays an important role and children are much more likely to enjoy food that is high in salt, fat or sugar (SFS), and therefore their preferences are tightly related to the ratio of such components (Cornwell and McAlister, 2011). This link between children and non-healthy food is so tight that is actually possible to predict a child's BMI (body mass index) by assessing his/her knowledge of brands offering products high in salt, fat and sugar (Cornwell et al, 2014).

Secondly, and also due to this primary predisposition, most companies of junk food aim at targeting children throughout marketing campaigns in a very young age so they can retain them as a loyal customers for life. Supporting this theory, there is evidence that overweighted and obese children were significantly more familiar with fast food restaurant logos than other food logos, meaning that high recognition of fast food restaurant logos may reflect greater exposure to fast food advertisements (Arredondo et al, 2009). Moreover, television viewing also contributes to high familiarity and consumption towards junk food (Dixon et al, 2007)

Contributing to this scenario there is also the fast food restaurant saturation in both urban and poor areas, which contributes to increase levels of childhood, especially in more economically undeveloped urban areas (Newman et al, 2013).

Summarizing, evidence shows us that it is the combination of natural physiological predisposition, effects of marketing campaigns and advertisement, and also greater availability at a lower cost that makes non healthy food one of the most desired and actually consumed by children.

Children relation with healthy food

We know that the relationship between children and healthy eating is not as good as it should be. In this study we will focus our attentions only on the fruit category, knowing also that just the consumption of those by itself is not enough in order to achieve a healthy and balanced diet. But it can work out in two different perspectives: 1- fruits and vegetables are the type of food sources that supply our body the most with essential micronutrients such as vitamins and minerals, while the macronutrients (fats, protein

and carbohydrates) can be found in almost every food source, so it is essential for us to consume it, especially for children in order to grow up healthy and 2- it can replace the consumption of other snacks that are more caloric but still less nutritive. According to WHO (2014) recommendations, school-aged children should decrease the consumption of total fats and sugars and increase the consumption of fruit and vegetables, as well as legumes, whole grains and nuts.

Currently, less than 15% of children between the ages of 4–8 years consume the recommended levels of fruit and vegetables (Schindler et al, 2013), and for example, in the US roughly 40% of children's diets come from added sugars and unhealthy fats (Reedy & Krebs-Smith, 2010). Despite this, children have the sense of what is healthy, and they consider fruits, natural juices and vegetables as being healthy options (Kuntz et al, 2012) so the problem relies much more on getting them to consume it more often.

But it is interesting when we do a comparison within the fruits and vegetables. In most researches of the topic we are likely to find differences between the acceptance of fruits and vegetables, individually. Although it was shown that exposure to the taste of unfamiliar foods is effective at promoting liking of previously rejected foods in children (Wardle et al, 2003), we also find differences in the acceptance if the experiment is done with fruits or vegetables. When exposed to these types of healthy foods, children appear to increase both the consumption and liking of fruits but no changes are likely to happen in terms of their willingness to eat vegetables (Osborne et al, 2012) and (Schindler et al, 2013). This means that children respond much better (meaning increased willingness to consume) to a stimulus when the experiment is done using fruit rather than vegetables, so we also may expect different results in our own research arising from the different sources of food (fruit or vegetables).

Fun in food and the link with packaging

Now that we have seen how children perceive healthy food and how unfortunately they do not consume it enough, it is time to suggest and study a way of making it more appealing before their eyes. Children love anything that is fun or perceived as fun, and food is no exception. Children are able to identify several dimensions of playfulness and fun, regarding food products (de la Ville et al, 2010). And one of those dimensions - The playful/fun transformation of the food product - can be related to packaging.

Children want fun and joy in their lives and food can be one vehicle to get there. Ike-Ogba and Johnson's (2010) present us with a very enlightening summary of what children want when it comes to food choices and how it can be deeply connected to packaging. In their own study they state three different aspects, that are backed up with other previous research, that are the most valued by children when it comes to food choices: the use of bright colors in the package (Marshall et al), being entertaining (Roberts, 2005) and the presence of cartoon characters (Hill and Tilley, 2002). Packaging can ally all these components and become a powerful and effective marketing tool among children, since they prove themselves sensitive and influenced by such stimuli.

Aligned with these findings, research done by Pires and Agante (2011), showed that when confronting children with the same product in two different packages, a colorful and fun packaging is more appealing before the eyes of the children and although the perception of taste was not significant, they verified a significant increase in children's purchase intentions towards the "fun packaging" product over the "regular one.

Moreover, there is also evidence that marketing and packaging can have a positive influence on children's food preferences towards branding (Robinson et al, 2007). This

study consisted in asking preschool children to taste several McDonald's products (which we can consider as an unhealthy brand due to the high levels of sugar, salt and fats in their products) and one of them were baby carrots (considered a healthy product). The children had to taste two samples of the same product: one in a McDonald's regular packaging and other in matched but unbranded packaging. As a result of the experiment for this particular product, more than half of the children that participated in the experiment (54%) said that the ones in McDonald's packaging tasted better, 23% said there was no difference in taste and finally 23% said the unbranded packaging had the better tasting carrots.

All of this shows how marketing, packaging and branding can be the solutions to promote healthy eating and somehow change children's preferences, but there is no evidence yet if packaging design alone has enough power (as it was shown through McDonald's, mostly due to the effect of branding and not packaging alone) to shift this preferences from junk food towards healthier options.

Hypothesis

H1: A healthy snack is more likely to have a positive impact on packaging evaluation if it is presented in a fun packaging.

H2: A healthy snack is more likely to compete with a non-healthy snack on "attitude towards the product" if it is presented in a fun packaging:

H2.1: A healthy snack is more likely to be perceived as tastier when compared to a non-healthy snack if it is presented in a fun packaging

H2.2: A healthy snack is more likely to be perceived as funnier when compared to a non-healthy snack if it is presented in a fun packaging

H3: A healthy snack is more likely to be chosen over a non-healthy snack, if the healthy snack is presented in a fun packaging.

Methodology

Legal Issues and Research Ethics

In order to conduct this experiment we followed all the legal and ethical recommendations by gathering consent of the three parties involved. This way, we made sure that the study was approved by: the schools where the experiment was conducted; the parents of participating children; and finally the children themselves.

Aligned with the legal requirements, we also took into consideration children's interests during this experiment. Thus, all ethic issues regarding the research when dealing with children were respected, by following the UNICEF's guidelines for children's participation in research (UNICEF, 2002).

Population – Reasoning & Cognition

The experiment has the purpose to study children between 7 and 9 years old. As it was already mentioned in the literature review, our intention is to target children as young as possible, as their cognitive ability enables them to fully understand and cope with the investigation. According to Piaget (1928) theory of cognitive development, children

between 7 to 11 start to think more logically and are able to classify objects into different sets, which means they are already able to make logic decisions and choices over two or more options presented to them. Thus, we feel that would be the right age to target, since it allows us to study younger children without putting the results on jeopardy due to lack of cognitive skills of the participants. Also, since the study involves written questionnaires, although they are very simple, it is crucial that the children are comfortable enough to understand and know how to fill them properly.

Research Design

In order to test our hypotheses, we conducted an experiment by manipulating visual stimuli and used structured questionnaires. Pictures of both healthy and non-healthy food snacks, with different packaging solutions (fun & regular) were presented to children who were part of this experiment, along with the questionnaires. The children had to answer several questions, assessing their attitudes towards packaging, attitudes towards product, and finally their own preference for the several products.

Because non-healthy products are by default perceived to have a funnier packaging to attract children, the only variable we can manipulate here and maybe also in the real world is the packaging of healthy food. Therefore, to conduct the experiment, we used 3 different images – one illustrating a non-healthy food snack in a regular packaging, one illustrating a healthy food snack in a regular packaging and finally one illustrating a healthy food snack in a fun packaging.

First, all groups (different classes) were divided in two homogeneous groups, a control and an experimental group. For the control group, children compared the two regular

packages of snacks (healthy vs. non-healthy) and had to answer the questionnaire based on those only. The experimental group compared the fun healthy package with the regular non-healthy package. The goal was to see if significant differences arise in both group's evaluation and preferences towards the products due to the shift on the healthy snack's packaging from a regular to a fun one. On both cases children made their decision based on the stimuli they got from the packaging only, with no taste evaluation. Moreover, in order to reduce method bias, the questionnaires stated clearly that there were no right or wrong answers, and children were told that their anonymity was assured as well as their option to withdraw from the experiment at any time if they wished so (Podsakoff et al, 2003). Finally, the order of pictures presented to both groups was counterbalanced so the answers would not come randomly.

The chosen products and their packaging design

Regarding the products themselves, in this experiment we used two distinct products. The products consisted on *sliced apple* as the healthy source of food (rich in vitamins and minerals) and a simple *muffin* as the non-healthy option (high in sugar and fat). The reasoning behind this decision relies on the following issues:

- First of all, our proposition is all about snacks, and these are not meant to replace a proper meal, but to be consumed in a school break or in between two meals instead. Therefore it would not make sense to choose a salad, a burger or a pizza to conduct this study, so we looked for something lighter and of smaller scale.
- We also wanted the products to have high familiarity among children so their choice is not over-influenced by product awareness or the lack of it. Because the experiment will only be based on visual stimuli (pictures) we chose products whose

taste are highly sensed by children so they know exactly what is inside each package. In order to come up with the right snacks, it was conducted a small and brief focus group with 5 children, where they stated which fruits they liked the most and which snacks they were used to bring to school. After that, we were able to conclude that apple is one of the most appealing fruits for them and muffins are also ranked high in children's awareness and preferences for a snack break.

We could have thought of other non-healthy products that would fill all the requirements above and might be even more deeply connected to children's preferences than a simple muffin, such as chips, chocolate bars or candy. But after talking with Professor Luísa Agante, who has a great experience with dealing and conducting studies with children within such age, we decided that it was for the best not to include these products in the study because it would not be fair to the children nor to the experiment itself. Those products are so much liked by children that we would expect they would not hesitate in choosing one of them as they preferred snack, despite the packaging or the manipulation of other marketing strategy of the alternative products, so the experiment would lose a lot of its purpose. We believe that such change is a major step that can maybe be done later with a more profound study, but in this experiment we are looking to unveil the tip of the iceberg only, by checking if there is evidence that it is possible to make a change in children's eating habits for the better, starting with small steps as we believe we are doing with these simple snack alternatives.

In order to come up with the fun packaging for the healthy food, we decided to use the same design as a previous study that focused on the influence of a fun packaging on children's sensory evaluation of a healthy product (Castelo, 2013). For the remaining packages (non-healthy snack and regular packaged healthy snack) we used real products that children have the opportunity to get in touch with at home or when they go to the

supermarket shopping with their parents. This will make this study more consistent and valuable, in the sense that results will give us a glimpse how the tested mechanism (fun packaging for healthy food) could actually compete side to side in the supermarket shelves with most of non-healthy snacks, since we are also focused on adding value to the business side of the question as we explained in the introductory part. We also expected that the use of pictures within the questionnaire would boost the success rate of the experiment since it increases the probability that the child stays focused during the task and fills the questionnaire in a more positive and proactive way, instead of rushing it just to get it done.

The snack alternatives will then be:

- A package of sliced apples from Maçã de Alcobaça already existing in supermarkets (Figure 1)
- A package of sliced apples that was designed especially for this experiment based on the research from Castelo (2013) (Figure 2)
- A package containing a simple regular muffin, that we can find in every grocery store (Figure 3)

Figure 1



Figure 2



Figure 3



All packages indicated explicitly which products they contained as we can see through the pictures, so the evaluation done by the children was not influenced by the lacking of knowledge of what was inside each packaging.

Measures

In order to test our hypothesis, the questionnaires were designed so they could measure the different assessment categories appropriately. In order to choose the best scaling for each variable, past research on this topic was taken into account, keeping also in mind that we are dealing with children from 7 to 9 years old and therefore experiments conducted under the same conditions were preferable to replicate, in order to make sure they have all the cognitive skills required to fill the questionnaires properly. The different variables were measured as in the following way:

To measure **attitude towards packaging** one single dimension was considered – coolness. Based on a study conducted by Pires & Agante (2011), the children had to choose over a 5-point semantic scale ranging from “not cool” to “very cool” for both healthy and non-healthy products they were given. This scale used smiley faces instead of numbers, so it would fit better to the understanding of the participants.

To measure **attitudes towards the product**, we also decided to replicate the scale used in the same study, which consisted in a smiley faces ranking where children had to choose the face that expresses their feeling the better. Regarding attitudes towards the product, children were asked to assess two dimensions – taste perception and fun. Therefore, they had to rank both products (healthy and non-healthy) through the 5

smiley face mechanism (ranged from unhappy to happy faces) to answer both questions in terms of “tastes bad/tastes good” and whether it is “boring/fun”.

To assess **preferences**, we used a scale already presented in a similar research with children and packaging where the children were also confronted with a choice regarding two different products – one fun and one regular (Castelo, 2013). The children had then to choose between three options: “Figure1”, “Figure2” or “Indifferent”. Figure 1 and Figure 2 represent images of the healthy and non-healthy snacks. The healthy snack however can be either in a fun packaging or in a regular one, depending on which group the child is in (control group or experimental group).

Results

The experiment was done in an elementary school via individual questionnaires given to the students. We obtained parent’s consents for 106 children divided into 56 males and 50 females, from 7 to 9 years old. There were 37 children from 2nd grade (7 years old), 35 from 3rd grade (8 years old) and 34 from 4th grade (9 years old).

During this experiment, and for both the control and experimental groups (composed by 53 children each), the healthy snack image was presented exactly 49.06% (for 26 students) on the left side of the paper and 50.94% (for 27 students) on the right, so their response is not biased by the image they see in the first place.

Table 1 summarizes the overall results of the questionnaire, derived by the SPSS program. In general, at a first sight, we can see that there were no relevant changes regarding the evaluation of the non-healthy snack (*muffin*) across the two groups. However, we will see that the attitudes towards packaging, product and purchase intention of the healthy snack (*sliced apple*) differ from the control to the experimental group.

Table 1: Summary of responses to the variables in the questionnaire.

	Type of group (control or experimental)	N	Mean	Std. Deviation	Std. Error Mean
Packaging evaluation of the muffin	control group	53	4,6415	,70967	,09748
	experimental group	53	4,4906	,82328	,11309
Packaging evaluation of the sliced apple	control group	53	3,7170	1,16648	,16023
	experimental group	53	4,6226	,73971	,10161
Taste perception of the muffin	control group	53	4,5472	,72234	,09922
	experimental group	53	4,6226	,65710	,09026
Taste perception of the sliced apple	control group	53	3,7736	1,25025	,17174
	experimental group	53	4,0755	,97762	,13429
Fun perception of the muffin	control group	53	4,5660	,69364	,09528
	experimental group	53	4,3774	,79000	,10851
Fun perception of the sliced apple	control group	53	3,8113	1,28687	,17676
	experimental group	53	4,5094	,79958	,10983
Preference	control group	53	1,2453	,43437	,05967
	experimental group	53	1,4528	,57399	,07884

NOTATION: From “packaging evaluation” to “fun perception”:
1- Very poor; 2- Poor; 3- Ok; 4- Good; 5- Very good
For “Preference”:
1- Muffin; 2- Apple

In order to test each hypothesis linked to the different variables, an independent sample t-test and a chi-square test (both with a 95% confidence level) were performed to each one, to check if the results obtained were actually statistically significant, this is, if the differences in the responses affecting the several variables was due to the group context (whether the children was part of the control or the experimental group).

H1: A healthy snack is more likely to have a positive impact on packaging evaluation if it is presented in a fun packaging.

The responses for the packaging evaluation of the sliced apple vary between 1 (very poor) and 5 (very good). The mean for the control group (3,7170) was significantly lower than the one for the experimental group (4,6226). According with the t-test, this difference is significant ($p=0,000$) as well as for the chi-square test (likelihood ratio = 0,000). Therefore H1 is not rejected and we can say that the packaging design affects packaging evaluation.

H2.1: A healthy snack is more likely to be perceived as tastier when compared to a non-healthy snack if it is presented in a fun packaging

Regarding taste perception, children in the experimental group assessed the sliced apple as being tastier (4,0755), on average, when compared to the ones in the control group (3,7736). However, this difference is not significant ($p\text{-value}=0.169$; likelihood ratio=0,086) and therefore we reject H2.1 through both tests, meaning that packaging does not affect taste perception that children have of the product.

H2.2: A healthy snack is more likely to be perceived as funnier when compared to a non-healthy snack if it is presented in a fun packaging

Once again, the experimental group perceived the sliced apple snack as being more fun (4,5094) than the ones in the control group (3,8113), being this difference significant ($p=0,001$; likelihood ratio=0,013), which lead us to not reject *H2.2* and therefore we can infer that packaging affects the perception of fun of a healthy snack.

H3: A healthy snack is more likely to be chosen over a non-healthy snack, if the healthy snack is presented in a fun packaging.

Finally, we have the choice criteria. Here the children had to choose between the consumption of the muffin (represented as 1) and the consumption of the sliced apple (represented as 2). In both groups the majority of the children chose the muffin, but while 75,5% in the control group choose the muffin, only 47,2% did it in the experimental group, being this difference significant (likelihood ratio=0,005). Therefore the packaging design of the healthy snack influences the choice towards the healthy product, over the non-healthy snack. In this variable it only makes sense to use the chi-square test since it is a choice between two elements, instead of a semantic scale used in the previous variables.

To conclude, here it is a summary of the hypothesis of this study as well as their output.

Table 2: Summary of the stated hypothesis and respective outcome

Hypothesis	Statement	Confirmation
H1	H1: A healthy snack is more likely to have a positive impact on packaging evaluation if it is presented in a fun packaging.	Confirmed
H2.1	H2.1: A healthy snack is more likely to be perceived as tastier when compared to a non-healthy snack if it is presented in a fun packaging.	Not confirmed
H2.2	H2.1: A healthy snack is more likely to be perceived as funnier when compared to a non-healthy snack if it is presented in a fun packaging	Confirmed
H3	H3: A healthy snack is more likely to be chosen over a non-healthy snack, if the healthy snack is presented in a fun packaging.	Confirmed

Discussion

The aim of this study was to assess the overall influence of packaging design on children consumer behavior, with eyes on two distinct purposes. On the one hand, the goal was to check whether packaging design of a healthy snack affects children's evaluation, attitudes towards the product and even preferences for consumption; on the other hand, we seek to go further and the ultimate goal was to assess how strong was the impact of packaging on shifting children preferences from unhealthy food to healthy food.

To do so, there were two distinct groups (a control group and an experimental group) that were presented with two different options of a snack each – a healthy option (sliced

apple) and an unhealthy option (muffin). The difference between the two groups was that the experimental group was presented with the healthy product in a fun packaging, while the control group was presented with the same product in a regular packaging. Both groups were presented with the same packaging for the unhealthy option.

The differences in the final results from the two groups led us to conclude that packaging influences attitudes towards the healthy product, both in terms of packaging evaluation and fun perception of the product itself, although it does not influence taste perception of the product. From these results we can already conclude that a healthy product in a fun packaging creates more positive attitudes from children towards the product, and therefore it is more likely to increase their willingness to purchase and try them, which is aligned with findings in past research on the topic.

However, and after reaching these conclusions, it was important to know how strong the impact of packaging can be in terms of actually shifting children's preferences from unhealthy food to junk food. From this experiment we can conclude that packaging does make a difference when it comes to choose between these two kinds of snacks, since in the experimental group the percentage of children that would prefer the healthy snack over the non-healthy one increase significantly when compared to the control group.

These findings can add value upon two different dimensions – 1) a public health dimension related to bad eating habits, which affects the overall population in almost every country, with special attention to children living in urban areas situated in developing countries (WHO, 2014). Overweight and obesity as well as the diseases associated with it are largely preventable and therefore by targeting children with such effective marketing tool, we are not only assuring the present but also preventing for the future in a sustainable way. And 2) a business and marketing dimension that can affect

companies' strategy and ultimately its performance. It is an effective marketing strategy for companies and marketers that hold healthy products on their portfolios and are seeking to promote them and ultimately steal market share from their competitors.

Summing up, this study shows how marketing techniques, more specifically packaging, can be powerful to the point of changing attitudes towards a product and even changing preferences for healthier options in a significant level.

At a governmental level, there are plenty opportunities to promote healthy food even in an environment mostly surrounded by non-healthy temptations. For example, at schools through vending machines, if the right packaging is adopted, we have now evidence that it is possible to compete with the non-healthy snacks that are already there, and start creating a habit on children through the exposure and familiarity with this type of food, that will most likely persist in the future. Also in the retail world, it may be possible to compete with non-healthy snacks if healthy food, that is not even packaged most of the times, is presented in a fun and adventurous way as children's most loved snacks. By creating healthy products in such way with the right packaging, parents are also encourage purchasing and making them accessible at home for their children, encouraging them towards its consumption and therefore promoting a healthy lifestyle also inside their domain. This shift in children's mindset may not be the easiest to put in practice and it is most likely to take some time, but the tool is there to be exploited; now it comes to the responsible entities to play their influential and critical part.

“Governments, International Partners, Civil Society, NGO's and the Private Sector have vital roles to play in shaping healthy environments and making healthier diet options for children and adolescents affordable, and easily accessible” (WHO, 2014).

Limitations and Further Research

Although it was shown through this experiment that packaging can influence the attitudes towards healthy food and even be strong enough to make them shift their preferences from an unhealthy snack to a healthy one, there are some variables that further research could account for and include in a future study on the topic. This experiment was only done within schools located in an urban area, so there was no comparison between the impact of packaging in an urban area and a rural area. Also, we used a private school since it was less demanding in terms of bureaucracy and therefore easier to get valid information and responders for the questionnaire, so there could be also the comparison between the results in a private versus a public institution.

Moreover, as a “first approach experiment” directly on the impact of packaging for changing habits from unhealthy food to healthy food, there were used basic products to serve as models, and as we have seen, we decided not to use “extreme” products that we think children were more likely to prefer unconditionally of marketing strategies such as packaging. So this study just unveiled the tip of the iceberg that can serve then for a more profound study on the impact of packaging facing healthy food with those “extreme” products like candy, chips or chocolate. Also, there were considered only snacks and future studies could do the same experiment with more complex meals.

Finally, further research could also take into account the sensory evaluation of taste, that is, presenting real products for the different packaging solutions and check whether or not the taste perception change and the as well as purchase intention.

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